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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,433	02/12/2002	Yanbin Shao	13854-009001	8735
26181	7590	10/18/2004	EXAMINER	
FISH & RICHARDSON P.C. 3300 DAIN RAUSCHER PLAZA MINNEAPOLIS, MN 55402			JUBA JR, JOHN	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/075,433

**Applicant(s)**

SHAO, YANBIN

**Examiner**

John Juba, Jr.

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 July 2004 and 08 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 5, 6, 8, 12-14 and 18-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 6, 8, 12, 13, 18, 19 and 21 is/are rejected.
- 7) ☒ Claim(s) 2, 5, 14 and 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 8, 2004 has been entered.

### ***Claim Objections***

Claim 14 is objected to because of the following informalities. Appropriate correction is required:

Claim 14 lacks antecedent basis for a first and a second forward component.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 6, 8, 12, 13, 18, 19, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Cao (U.S. Patent number 6,760,158). Beginning with claim 1, and referring *for example* to Figure 6h, Cao discloses an optical apparatus comprising

first input port (116a) operable to receive light including a first component (odd wavelength) and a second component (even wavelength) having a first (S) and a second (P) polarization, respectively [There are four “components” in all: odd wavelengths of S and P polarization input to the polarizing port and even wavelengths of S and P polarization components input to the port. In each case, the s-polarized components have their states rotated to P by the polarizing port, as explained with regard to Fig. 1d];

a polarization beam splitter (102) optically coupled to the first input port and operable to reflect the first component (odd wavelength) of light of the first (S) polarization [toward beam splitter (602)] and to pass the second component (even wavelength) of light of the second (P) polarization [as it enters initially];

a reflector (670) optically coupled to the polarization beam splitter;

a non-reciprocal device (616)(618) optically coupled to the reflector and operable to convert the first component (odd wavelength) of light of the first (S) polarization into light of the second (P) polarization;

a first output port (116b) operable to receive the first component (odd wavelength) of light of the second (p) polarization from the non-reciprocal device (616)(618); and

a second output port (116c) operable to receive the second component (even wavelength) of light of the second (P) polarization from the polarization beam splitter (102) and through additional components substantially contemporaneously in time with the receipt of the first component of light at the first output port.

The apparatus comprises all of the positively recited elements and performs all of the recited functions, and thus fairly constitutes a “circulator” in the same way as does the claimed combination.

With regard to claim 3, element (602) may be regarded as a “polarizer” optically coupled to the non-reciprocal device.

Turning to claim 8, and referring *for example* to Figures 5a and 5b, Cao discloses a method for transmitting light among a first input port, a first output port, and a second output port, the light having either a first polarization (P) or a second polarization (S), the method comprising:

transmitting a light signal including a first component (even wavelength) and a second component (odd wavelength) having a first (P) and a second polarization (S), respectively, from the first input port (116d) with the first polarization (P) [after rotating the state of the s-polarized odd wavelength component in the polarizing port, as explained with regard to Fig. 1d] onto a polarization beam splitter (502);

[rotating the polarization states of both components to S];

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directing the first component (even wavelength) of light onto a first reflector (110);

[rotating the polarization state of the even wavelength in the interferometer to the first (P) polarization];

reflecting the first component (even wavelength) of light onto a first non-reciprocal device (106)(108);

changing the polarization of the first component (even wavelength) of light from the first polarization (P) to a second polarization (S);

directing the first component (even wavelength) of light into a first output port (116b);

[directing the second component (odd wavelength) of light onto the first reflector (110), maintaining its polarization state as the second (S) polarization];

directing the second component (odd wavelength) of light onto a second non-reciprocal device (202)(204);

maintaining the polarization of the second component of light as the second component passes through the second non-reciprocal device; and

directing the second component of light into the second output port (116c) substantially contemporaneously in time with the directing of the first component of light in to the first output port.

With regard to claim 12, the directing the first component (even wavelength) of light into a first output port (116b) includes directing the component through the incident surface of a "polarizer" (102).

With regard to claim 13, directing the second component (odd wavelength) of light into the second output port (116c) includes directing the component through the incident surface of a "polarizer" (104) or (502).

Turning to claim 18, and referring *for example* to Figure 8, Cao discloses an optical apparatus comprising

first (116b) and second (116c) input ports, the first input port being operable to receive a first light signal ( $\lambda_1$ ) of a first polarization (P) and the second input port (116c) being operable to receive a second light signal ( $\lambda_2$ ) of the first polarization (P), a receipt of both being substantially contemporaneously in time;

a first reflector (706) optically coupled to the first input port (116b);

a non-reciprocal device (718)(720) optically coupled to the second input port (116c) and operable to convert the second light signal ( $\lambda_2$ ) of the first polarization (P) into a second light signal of a second polarization (S) [after reflection at (708)];

a polarization beam splitter (102) optically coupled to the first reflector (706) [via (702)(714)(716) & (602)] and to the non-reciprocal device (718)(720) [via (604)(104)(110)(106) & (108)], and operable to pass light of the first polarization (P) [from (104)] and reflect light of the second polarization (S) [from (602)];

a second reflector (110) optically coupled to the polarization beam splitter (102) [via (104)(106) & (108)]; and

an output port (116a) optically coupled to the second reflector [via (104)(106)(108) & (102)] and operable to receive the first light signal ( $\lambda_1$ ) of the first polarization (P) and the second light signal ( $\lambda_2$ ) of the second polarization (S) [after rotation by a wave plate device in the polarizing port as explained in connection with Figure 1d].

The apparatus comprises all of the positively recited elements and performs all of the recited functions, and thus fairly constitutes a "circulator" in the same way as does the claimed combination.

With regard to claim 19, element (604) may be regarded as a "polarizer" optically coupled to the non-reciprocal device (718)(720).

### ***Allowable Subject Matter***

For the reasons previously indicated (April 21, 2004), claims 2, 5, 14, and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Response to Amendment***

For the reasons urged by Applicant, the amendment of claim 1, 8, and 18 is sufficient in overcoming the previous rejection of claims 1, 3, 6, 8, 12, 13, 18, 19, and 21 under 35 U.S.C. §102(e) as being anticipated by Li (U.S. Patent number 6,487,014).



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### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gu (U.S. Patent Appl. Pub. No. 2003/0103265 A1) discloses an optical apparatus with beam splitters, non-reciprocal devices, and reflectors.

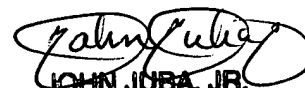
Hulse, et al (U.S. Patent number 6,690,513) disclose an optical apparatus with polarizing beam splitter, non-reciprocal device, and a reflector.

Grasser (U.S. Patent number 6,680,470) discloses an optical apparatus with polarizing beam splitters, a non-reciprocal device, and reflectors.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Juba whose telephone number is (571) 272-2314. The examiner can normally be reached on Mon.-Fri. 9 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Drew Dunn whose number is (571) 272-2312 and who can be reached on Mon.- Thu., 9 - 5.

The centralized fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for *all* communications.

  
JOHN JUBA, JR.  
PRIMARY EXAMINER  
Art Unit 2872

October 14, 2004